

**TELECOM CORPORATION OF
NEW ZEALAND LIMITED**

SUBMISSION TO THE COMMERCE
COMMISSION
ON
“APPLICATION OF A TSLRIC PRICING
METHODOLOGY-DISCUSSION PAPER”

16 August 2002

INTRODUCTION

- 1 Telecom appreciates the opportunity to comment on the preliminary views expressed in *Application of a TSLRIC Pricing Methodology – Discussion Paper* (“the discussion paper”). Attached to this submission are the following reports commenting on aspects of the TSLRIC pricing methodology:
 - A paper from the London office of PricewaterhouseCoopers (*PwC*) discussing TSLRIC pricing methodology;
 - A paper from the New Zealand office of PwC discussing issues associated with the estimation of the weighted average cost of capital;
 - A report from Charles River Associates (*CRA*) (*TSLRIC Pricing – A Response to the Commission’s Discussion Paper*) on the dynamic efficiency implications of TSLRIC pricing methodology (“CRA Dynamic Efficiency”); and
 - A report from CRA (*TSLRIC Pricing – Financial Issues*) on the financial issues associated with TSLRIC pricing methodology (“CRA Financial Issues”).
- 2 There is obviously a lot of ground to cover (and in this regard Telecom once again commends the Commission for its proactive and open process). This submission highlights some of the material covered in the attached reports, and makes some additional points that draw on Telecom’s experience and expertise. Telecom looks forward to discussing these issues further with the Commission at the conference.

DYNAMIC EFFICIENCY FRAMEWORK

- 3 Telecom supports the Commission’s efficiency objectives for interconnection pricing, and endorses the Commission’s priority of achieving dynamic efficiency.
- 4 Charles River Associates, in *CRA Dynamic Efficiency*, explains that dynamic efficiency is likely to be maximised by interconnection prices that:
 - offer an access provider sufficient compensation for interconnection;
 - provide the price signals to induce enhancement of existing networks or the introduction of new networks; and
 - incentivise market rivalry between network operators that focuses on investment in new technologies and new facilities.

- 5 Crucially, this will only be achieved if the Commission adopts a meaningful and realistic 'efficient provider standard' when implementing the TSLRIC methodology.
- 6 Telecom has made the point in previous submissions that a dynamically efficient provider need not be, and would not be expected to be, statically efficient at any snapshot in time, because the realised or *ex post* outcomes of investment decisions are most unlikely to always be (statically) efficient even if the decisions were dynamically efficient *ex ante*. The reasons for this include uncertainty (particularly in the face of rapid technological change and uncertain demand growth), irreversible or sunk investments in particular network configurations, and transaction and adjustment costs.
- 7 In this regard the scorched node approach will have less pernicious effects on dynamic efficiency than will the scorched earth approach, but the general direction of its effects will be the same, *viz.* greater risk of asset stranding, exposure to risks of technological changes, and a corresponding need of higher prices to induce appropriate investments.
- 8 CRA cautions against an overly narrow focus on static efficiency and static technology, as this could lead to misplaced concerns about "inefficient duplication" or "efficient duplication" of all or parts of Telecom's fixed PSTN. Duplication could be inefficient if it is taken to mean facilities-based competition between two or more networks utilising identical technology and with identical cost structures. However, the rate of technical change in telecommunications means that in reality, facilities-based competition is driven by technical changes which reduce the costs of existing technologies, create alternative technologies and allow the delivery of new services demanded by consumers. The long term interests of end users are best served when their evolving and diverse needs are met by the introduction of new and differentiated services through alternative facilities, even when they duplicate significant parts of the functionality of the existing infrastructure.
- 9 The Commission should aim to preserve the incentivising force of interconnection prices by setting prices at a level that allows a reasonable return. So long as market signals are not distorted, access seekers or other investors can and are in a better position to make their 'build-or-buy' decision. The Commission will be able to test its success in creating a dynamically efficient environment by observing over time the extent of the investment (by the incumbents and entrants) in new technologies and services.

KEY ISSUES

- 10 A number of the key issues to be resolved in settling the TSLRIC methodology are highlighted below. These are discussed in more detail in the attached reports by CRA and PwC.

Defining the Total Service

- 11 Telecom believes that limiting the services modelled to fixed PSTN services (the stand alone model) is a valid modelling approach which provides a ceiling for the appropriate interconnect price.
- 12 The inclusion of other services needs to be done with great care, particularly because of the common cost allocation procedures which then come into play. This model (the full services model) provides a floor for the appropriate interconnect price.
- 13 Telecom considers the most appropriate course of action would be for the Commission to carry out both exercises. Such an approach is a reasonable recognition of the approximations and uncertainties inherent in the TSLRIC modelling exercise. The final interconnect price should then be set somewhere between these two modelling outcomes so as to best meet the purposes of the Act.

Top down and bottom up modelling approaches

- 14 The Commission has expressed a preliminary preference for a bottom-up modelling methodology. Bottom-up models have an inherent tendency to underestimate the costs an operator would actually incur. A bottom-up model only registers those costs that have been explicitly modelled, and as a matter of practical reality not all costs will be captured by the modellers. Bottom-up models are particularly poor at estimating operating costs. Thus, if the Commission were to prefer a bottom-up model it would be committing to the likelihood that it would underestimate cost.
- 15 PwC emphasises that top-down models can be, and are, used to calculate forward looking costs. A combination of top-down and bottom up models has been used by Oftel and ODTR (Ireland). In the top-down approach, efficiency can be adjusted for separately, and modern technology can be incorporated through Modern Equivalent Asset valuation.
- 16 PwC recommends that interconnection costs should be based either on:
- a top-down model using actual firm accounting data which is adjusted in such a way that it provides the forward-looking costs of an efficient operator;
 - or

- both a top-down and bottom-up analysis (which should be reconciled with each other).

- 17 If a bottom-up model is to be used, the Commission needs to be conscious that the bottom-up approach is a very poor estimator of network operating costs and non-network capital and operating costs (ie three of the four cost categories). These cost categories are most reliably derived on a top-down basis.
- 18 The comments on the bottom-up approach contained in this submission and the attached reports should be read with this in mind, and are an attempt by Telecom to improve the second-best approach (should the Commission choose that course).

Appropriate efficiency adjustment

- 19 When using a top-down approach, PwC recommends an efficiency adjustment using the Stochastic Frontier Analysis, as PwC proposes in the TSO context.
- 20 If using a bottom-up approach, care must be taken to use consistently realistic assumptions if credible and robust results are to be achieved. Any assumptions must reflect a full appreciation of the dynamic nature of network planning and operation. For instance a decision to assume the latest technology would be used throughout the network as soon as it became available would not only be offensive to the dynamic efficiency concerns discussed by CRA, but also would have knock-on effects within the model.
- 21 Advances in switching or transmission technology become available every one or two years. If the Commission was to assume the latest technology was used at all times, then to be consistent the asset lives used in the tilted annuity calculation would have to be adjusted accordingly to reflect the full decrease in economic value implied. Clearly this would not be efficient. For these reasons, assumptions regarding the uptake of the “latest” technology should be conservative and realistic.

Treatment of common costs

- 22 A large proportion of the TSLRIC costs are common costs, and for this reason the basis selected for the allocation of common costs is a very important part of the TSLRIC calculation.
- 23 PwC notes that there are a number of difficulties in implementing the allocation methods that will give the most efficient outcome. In particular, Ramsey pricing involves high information requirements, and overcoming uncertainties around elasticity estimates. Given the importance of the common cost allocation to the model and its impact on the eventual TSLRIC price, Telecom considers the Commission should investigate thoroughly the possibility of using one of the more

sophisticated allocation methods before concluding it has no choice but to use a third-best allocation rule.

PSTN Common and Incremental Costs

- 24 In *CRA Dynamic Efficiency* CRA explains that the local access network is a common cost of interconnection, and should be included in the TSLRIC calculation. Since the origination and termination of interconnected calls uses capacity on the local access network (that would otherwise be used for intra-network calls), the cost of local access is a common cost in respect of interconnection. This is an important omission from the Commission's methodology.
- 25 The TSO Deed contains a list of agreed call types that the line rental covers, and this excludes interconnection origination services and the calls enabling those services. The reason for this exclusion (as noted in the Deed) is that such calls are covered by pricing arrangements between Telecom and the carriers. Telecom considers this means that such interconnect calls should be priced in a way that provides a contribution to the common costs of the local access network given that network is used to provide both TSO services and interconnect services.

Costs common to the TSO and TSLRIC services

- 26 The definition of forward-looking common costs excludes "any costs incurred by the service provider in relation to a TSO instrument". Telecom agrees with the Commission (at paragraph 41 of the discussion paper) that this proviso to the definition of forward-looking common costs is obviously intended to prevent double recovery of cost.
- 27 However, Telecom disagrees that either the intention or the wording of the proviso requires the Commission to adopt the position it suggests at paragraph 177 of the discussion paper: that where a cost is common to both the access and core networks it should be entirely excluded from the TSLRIC calculation, with the result that interconnection service should bear less than the appropriate allocation of the common cost.
- 28 This is a perverse outcome. It was obviously not intended by Parliament, which included the proviso to prevent double recovery rather than mandate the exclusion of a proper allocation of common costs from the TSLRIC calculation. As stated above, a very large proportion of TSLRIC costs are common costs, as interconnection calling uses the same network elements as free local calling. The proposition at paragraph 177 of the discussion paper would result in a TSLRIC figure of (nearly) zero.

- 29 This position is better expressed in paragraph 41 of the discussion paper. What can properly be said to have been “incurred in relation to” the TSO, and what the proviso is intended to exclude from the TSLRIC calculation, is that part of the common costs included in the TSO calculation.
- 30 As long as any common costs are allocated between the TSLRIC and TSO services, there can be no double recovery. While interconnection will appear in the TSO model, its revenues will equal its costs (ie. the TSLRIC). Thus the interconnection service will not contribute to the TSO net cost.

Required rate of return

- 31 As the Commission has recognised, an important parameter in the TSLRIC model will be the required rate of return. Attached is a report from PwC (New Zealand) on issues associated with estimating the appropriate weighted average cost of capital, and a report from CRA addressing WACC-related issues and asymmetric risks.
- 32 One point highlighted by PwC is that the asset beta for the TSLRIC calculation is unlikely to be comparable to the asset betas of utility companies, due to significant differences between the telecommunications markets and a typical utilities market. PwC’s view is that Telecom’s equity beta, with adjustments for business not related to the TSLRIC, as a benchmark for the beta for assets used to provide fixed PSTN services, appears to be consistent with the approach taken by regulators overseas. This would be supported by a review of equity betas of local and foreign companies that are comparable to Telecom.
- 33 CRA states that the standard approach to the calculation of the WACC should be regarded as a starting point for a consideration of the reasonable rate of return on capital invested. CRA references a substantial body of theoretical work which supports a consideration of specific risk and the cost of options foregone, as well as evidence that competitive firms take these factors into account in real-world capital budgeting decisions.

Accuracy

- 34 Having argued against “rough justice” in the initial pricing principle context, Telecom is not about to argue for “justice delayed” in the TSLRIC context. However, it is the case that the Act affords the Commission the opportunity to invest in producing a high quality TSLRIC model. Telecom is concerned at the number of points where the Commission has suggested it might opt for approximation or adoption of ratios or rules developed elsewhere, without first investigating the feasibility of measuring the relevant parameters and cost drivers. There is a high risk of a substantial departure from reality and a realistic efficient provider standard.

- 35 Telecom recognises of course that any model is just that – it is a stylised version of reality, not the real world itself. However in this case there may well be significant transfer of shareholder wealth between competing companies depending on the decision the Commission makes. Therefore it is incumbent on the Commission to follow a disciplined and rigorous approach to its modelling and provide logical and transparent reasons for compromises it might wish to make.

COMMENTS ON SPECIFIC POINTS RAISED BY THE DISCUSSION PAPER

- 36 This section addresses and provides comments on specific points raised in the discussion paper.

Consistency of models (paragraph 71)

- 37 While there may be some benefits in using the same approaches for the TSLRIC and TSO models, these are slight and are outweighed by disbenefits.
- 38 The Act does not require the same approach, with a forward looking cost basis mandated for the TSLRIC model but not the TSO. This is sensible. The TSLRIC model is about setting forward looking prices which do not deter entry of efficient operators into the market. On the other hand the TSO calculation is about compensating an efficient operator for expenses incurred delivering a service for which there is no or limited competition. The two calculations are meeting quite different needs. The only time that they meet is where there is the potential for overlap between costs recovered under the TSO and costs recovered under Interconnect. This can be dealt with separately.
- 39 It is also apparent that the type of model that is appropriate to calculate each requirement is likely to be quite different. The TSO model should be able to identify individual customers with their own unique costs to serve. On the other hand it is appropriate to have quite a substantial degree of averaging in the TSLRIC model – a unique interconnect price is not needed for each customer. Thus the ideal models will be quite different in methodology and have different computing requirements – indeed Telecom’s TSO model has been built within a database (SAS), while it is likely the TSLRIC model can be built on a spreadsheet.
- 40 Telecom does not consider that it is appropriate to limit the richness and accuracy of one or the other model in any Procrustean fashion. To do so is to deliberately forgo accuracy in the interests of expediency.

POIs (paragraphs 108 – 110)

- 41 The Commission indicates the location of points of interconnection may be the subject of a determination. Telecom is unsure as to whether by “point of

interconnection” the Commission means the physical handover point, or the switching points that sit in behind the handover point. Telecom is conservative in establishing additional handover points given the consequences for future network development.

- 42 Telecom has not objected to further or different switching points, provided that implementing them is economically, operationally, and commercially sound. Telecom would, however, caution the Commission on the complexities involved. The decision to establish an additional switching point (such as a direct route to a local exchange) involves assessing the costs and benefits of operational overhead (an interconnecting switch includes a number of additional routing and billing data tables which must be maintained as both networks evolve, as well as the actual links to the other network which must be dimensioned, provisioned and managed), routing efficiency, and network costs.
- 43 The issues are not uni-dimensional – while direct routing avoids a switching step, and so the costs associated with that switching step, tandem switching serves an economic purpose – by combining small traffic streams, it improves route efficiencies and reduces routing complexities. It does not just add cost, but in fact reduces cost by increasing overall efficiency.
- 44 Telecom would be happy to discuss with the Commission the detail of these issues.

Geographic disaggregation

- 45 It is apparent that the level of geographical disaggregation in the model will influence the price structure the Commission might propose. Therefore the correct approach is to start with a very disaggregated model so that the Commission is in a position to understand what drives costs and therefore optimal ways in which prices might be structured. The approach of the Commission in paras 139-144 suggests deciding on an appropriate level of disaggregation prior to commencing the modelling. Not only is this in the wrong order, but also possible pricing structures will be limited to these initial aggregations and may well not be optimal. Telecom would be particularly concerned if the model structure is driven by preconceptions about key cost drivers (such as the single : double tandem model) which may not be appropriate in New Zealand circumstances.

Structure of interconnection prices (Chapter 11)

- 46 The Commission has asked for comment on:
- the merits of using the current commercial construct for interconnection prices;

- the appropriateness of the Commission moving away from the current commercial construct, perhaps to a pricing structure not sought by either party to a dispute;
- the appropriateness of the Commission determining an average price and leaving the parties to negotiate the detailed pricing structure; and
- the specifics of different pricing structures, including the basis upon which prices should depart from simple average per-minute pricing.

The current commercial construct

- 47 The current commercial construct is based on Local Interconnect Calling Areas (LICAs), which correspond to a local calling area as this concept is used in retail price structures. There are three categories of LICAs: Primary Major, Secondary Major, and Minor. There are 5 Primary Major LICAs, 19 Secondary Major LICAs, and 78 Minor LICAs.
- 48 Interconnection takes place and traffic is handed over between carriers only in Major LICAs. In the several of the most populous LICAs, interconnection is provided at more than one exchange within that LICA.
- 49 Traffic originating from or having its destination in a Minor LICA is trunked to the associated Major LICA and is handed over there. This broadly reflects the structure of the Telecom network; even traffic internal to the Telecom network is usually not switched within a Minor LICA, but is carried to the associated Major LICA.
- 50 Telecom does not provide interconnection to every local exchange, believing that its obligations are completely satisfied by making interconnection available in significant local calling areas (covering an estimated 75–80% of the population).
- 51 Interconnecting at older types of switches was not considered necessary nor viable, due to the cost of developing in those switches the capability for interconnect routing and billing, and the expectation that over time these switches would be retired and replaced with RLUs. RLUs do not support interconnection. The LICA structure was designed to be stable over many years despite Telecom’s ongoing switching consolidation.
- 52 Adding interconnection sites adds to operational costs as there is an interconnection “overhead” involved in, for example, maintaining routing tables with carrier access codes and in making space for the other carrier’s equipment available at the exchange premises. Adding interconnection sites can also lead to

routing inefficiencies, in that it can require that traffic be sent to an exchange other than the one on the normal call path in order to be handed over.

- 53 The LICA structure largely aligns the interconnect commercial arrangements with the retail price structure, in the sense that the retail price structure for calling is arranged around local calling areas too. This is beneficial from an entrant's point of view in that it provides certainty of cost relative to the retail rates they face from their competitor, Telecom.

The LICA structure reflects underlying costs

- 54 To perfectly reflect all the drivers of variance in costs would lead to a price structure that is so complex as to be costly (if not impossible) for the parties to implement. Any operational price structure is therefore a compromise. It is Telecom's view that the LICA structure represents a reasonable compromise, in that it reflects the two main cost drivers: switching and transport.
- 55 Switching costs depend on the type of switch or concentrator, how much traffic it carries (switches taking high traffic loads generally have lower unit costs than switches with low loadings), and how many switches a call runs through from origination to termination.
- 56 Transport costs also tend to display scale economies. Where traffic volumes are high, unit transport costs are lower. Transport costs are also distance and geography dependent – for example, the Chatham Islands are very expensive to serve as we rely on satellite links for transport. Isolated areas tend to cost more because of the longer distances involved, small volumes, and, in many instances, difficult topography requiring costly transport methods.
- 57 The three LICA classes reflect three broad network structures which reflect the dynamics of switching and transport costs:
- Primary Major LICAs all have multiple switches, and (with the exception of Dunedin) have both tandem and local switches. They consequently tend to have higher traffic density and shorter transport links.
 - Secondary Major LICAs all have a central 61E switch, and few of them have a second 61E in the LICA. Transport links to Kai switches and RLUs in the area tend to be low density, and somewhat longer than those found in Primary Major LICAs.
 - The majority of Minor LICAs have no 61E switch, but are served by a Kai or RLU, or by a 61E located in another LICA. Their costs are driven by

long, low density, links to the host switch (usually in the associated Major LICA).

Is it appropriate for the Commission to depart from the established commercial model?

- 58 No. While access seekers and Telecom sometimes disagree over the location and number of POIs, there is no dispute over the LICA structure. No party has offered an explanation as to why it is inappropriate, and there is no discussion in the discussion paper of the merits of the LICA structure. As noted above, the LICA structure is reflective of the principal cost drivers, and aligns the interconnection pricing structure with the retail pricing structure.
- 59 If the Commission were to contemplate a shift away from the LICA pricing structure the following consequences would need to be evaluated.
- 60 Non-price terms, which are presently written around the LICA structure, would have to be re-designed. In particular, the present terms relating to the distinctions between various call types, the principles of call handover, and network numbering, are founded upon the present LICA structure and would need to be re-thought from the ground up. Further, the discussion between the industry and the Commission on Bill and Keep, including the Frontier paper, is founded upon the concept of “intra-LICA call”, a concept that has no meaning absent the LICA structure.
- 61 A number of carriers presently interconnect with Telecom on the basis of the LICA structure. If a new structure were implemented in incremental fashion as and when determinations were made, it could have unintended consequences as it would create economic differences between carriers at different points, and these differences would be exploited. Vodafone is an exception – its present interconnection arrangements with Telecom follow a different model, reflecting the non-geographic nature of mobile call handover. A perusal of the Telecom-Vodafone agreements will be instructive as to the impact on non-price terms arising from a different pricing construct.
- 62 The interconnection billing systems of the carriers are oriented around the LICA structure, and the network signalling information exchanged between the carriers is designed so as to convey LICA information. The carriers would have to undergo time-consuming and costly software development, testing, and implementation phases.
- 63 Changing the price structure would change the most cost effective routing of calls between the networks, leading to demands for rearrangements of links and resulting one-off costs. The Commission would need to be aware of these costs when making any decision to alter the interconnection price structure.

Should the Commission restrict its determination to the average price?

- 64 Yes. When determining interconnection charges the Commission should set an average price and allow Telecom the freedom to set the structure of those prices consistent with this average level.
- 65 There are a number of advantages to end users from the Commission not attempting to micro manage individual prices for interconnection services. First, the most efficient structure of prices depends critically on a commercial understanding of current network capacity constraints, the marginal costs of network capacity expansion and the responsiveness of end users to changes in these charges.
- 66 Furthermore, setting a (weighted) average price provides the regulated operator with an incentive to price efficiently in order to maximise sales and therefore maximize revenues. Telecom is best placed to understand how the relevant drivers interact at any given time and it is therefore likely that Telecom would set a more efficient price structure than the Commission.
- 67 Finally, the average price approach significantly reduces the administrative costs of regulation both for the Commission and for Telecom. In order for the Commission to be in a position to sensibly set the structure of interconnection charges there would have to be a significant transfer of knowledge between Telecom and the Commission staff. Even with the current high level of goodwill, this would be a costly and time-consuming exercise.
- 68 CRA explains in *CRA Dynamic Efficiency* that complex pricing structures are fraught with difficulties. The optimal structure of an interconnection contract is affected by the nature of demand (elasticity and location) and supply (cost and location), the possibilities for arbitrage and the allocation of risk between the parties. Allowing existing structures to evolve with shifts in supply, demand and regulatory variation over time will avoid complexity of calculation and allow the pressures for change to be articulated and, where justified, effected. This will almost certainly be the most comprehensible and efficient approach.

The merits of departing from average per-minute pricing

- 69 The Commission is right to be concerned about the difficulties attendant upon more complex pricing arrangements, and to be cautious as a result. Differentiating by time of day is particularly problematic. Traffic peaks do move, which would add to the complexity of the regulatory design. Further, in the presence of a peak charge it would be possible to manipulate or generate traffic flows so that the traffic one pays for is in the off-peak period and the traffic one earns revenue for is in the peak period.

- 70 Issues of distance and geographic region are best considered when assessing the merit of the current LICA pricing structure, and whether there should be a departure from this construct (discussed above). The current pricing structure already includes a flagfall charge per interconnect call.

Services provided on a fixed PSTN other than Telecom's

- 71 Telecom agrees with the discussion of the issues in Chapter 12, and agrees that the difficulty will be in the implementation. In particular, if the other carrier is forced to accept a pricing structure that is inappropriate given its costs, then this might create unforeseen arbitrage opportunities (for either party). Again, this is a good reason for letting the carriers determine the detail of the interconnection price structure.